

WHAT IS CLAIMED IS:

1. In combination for providing at selective positions on a patient's skin signals representing the patient's parameters at these positions,

an electrode constructed to be attached to the patient's skin at the  
5 selective positions to provide signals indicative of the parameters on the patient's body at the selective positions,

an amplifier having an input terminal with an impedance approaching infinity and providing at the output terminal signals corresponding to the signals from the electrode, and

10 an output stage connected to the amplifier and constructed to reject noise and to pass signals at frequencies below a particular value.

2. In a combination as set forth in claim 1 wherein  
a common mode rejection is provided to the signals from the electrode to eliminate noise from the signals from the electrode before the

15 introduction of the signals to the amplifier.

3. In a combination as set forth in claim 1 wherein  
the input impedance of the amplifier is approximately  $10^{15}$  ohms.

4. In a combination as set forth in claim 1 wherein  
the impedance of the patient's skin is in a range to approximately 200  
20 kilohms and wherein the electrode is attached to the patient's skin.

5. In a combination as set forth in claim 2 wherein  
the input impedance of the amplifier is approximately  $10^{15}$  ohms, and  
wherein

the impedance of the patient's skin is in a range to approximately 200 kilohms, and wherein

the electrode is attached to the patient's skin.

6. In a combination for providing signal at selective positions on a patient's skin of the patient's parameters at the selective positions,  
an electrode constructed to be applied to the selective positions of the patient's skin to provide a signal representative of the patient's parameters at these selective positions,

an amplifier connected to the electrode to amplify the signals at the electrode, and

a low pass filter connected to the amplifier to provide an output in which noise is eliminated and signals in a particular frequency range are passed by the low pass filter,

the amplifier having characteristics of providing a high input impedance and a low output impedance.

7. In a combination as set forth in claim 6 wherein the amplifier constitutes a differential amplifier for eliminating noise from the signals provided by the electrode.

8. In a combination as set forth in claim 6 wherein the amplifier includes a differential stage for eliminating noise from the signals provided by the electrode.

9. In a combination as set forth in claim 6 wherein the amplifier provides an input impedance approaching infinity.

10. In a combination as set forth in claim 6 wherein  
the amplifier and the high pass filter are disposed on a printed circuit  
board and the amplifier is isolated electrically from the high pass filter on the  
printed circuit board.

5 11. In a combination as set forth in claim 9 wherein  
the high pass filter limits the amplitude of the output from the high  
pass filter to facilitate the operation of the amplifier in processing the signals and  
wherein

the amplifier has a low output impedance.

10 12. In a combination as set forth in claim 6 wherein  
the amplifier provides an input impedance approaching infinity, and  
wherein

the amplifier and the high pass filter are disposed on a printed circuit  
board and the amplifier is isolated electrically from the high pass filter on the  
15 printed circuit board, and wherein

the high pass filter limits the amplitude of the output from the high  
pass filter to facilitate the operation of the amplifier in processing the signals and  
wherein

the amplifier has a low output impedance.

20 13. In combination for providing at selective positions on a patient's skin  
signals representing the patient's parameters at these positions,

a first electrode constructed to be attached to the patient's skin at the  
selective positions to provide signals representing the patient's parameters at these  
positions,

a second electrode constructed to be attached to the patient's skin at positions different from the selective positions to provide reference signals,

amplifiers connected to the first and second electrodes and having properties of providing a high input impedance approaching infinity and having a  
5 low output impedance, and

a high pass filter connected to the amplifiers for eliminating noise and for passing signals at relatively high frequencies.

14. In a combination as set forth in claim 13 wherein  
the amplifiers are constructed to obtain the difference between the  
10 signals on the first and second electrodes.

15. In a combination as set forth in claim 13 wherein  
the amplifiers provide a differential relationship for eliminating noise.

16. In a combination as set forth in claim 13 wherein  
the combination of the patient's skin and each individual one of the  
15 electrodes has an impedance to approximately 200 kilohms and the amplifier has an input impedance of approximately  $10^{15}$  ohms.

17. In a combination as set forth in claim 13 wherein  
the combination of the patient's skin and each individual one of the  
electrodes has an impedance to approximately 200 kilohms and the amplifier has an  
20 input impedance of approximately  $10^{15}$  ohms.

18. In a combination as set forth in claim 13 wherein  
each of the amplifiers has an output impedance of approximately fifty  
(50) ohms to seventy-five (75) ohms.

19. In a combination as set forth in claim 13 wherein  
the amplifiers are constructed to obtain the difference between the  
signals on the first and second electrodes and wherein

the amplifiers provide a differential relationship for eliminating noise.

5 20. In a combination as set forth in claim 19 wherein  
the combination of the patient's skin and each individual one of the  
electrodes has an impedance to approximately 200 kilohms and the amplifier has an  
input impedance of approximately  $10^{15}$  ohms

each of the amplifiers has an output impedance of approximately fifty  
10 (50) ohms.

21. In combination for providing at selective positions on a patient's skin  
first signals representing the patient's parameters at these positions,

a first electrode coupled to the patient's skin at one of the selective  
positions for producing first signals representing the patient's parameter at this  
15 position,

a second electrode coupled to the patient's skin at a position other than  
the selective position for producing reference signals,

a first amplifier coupled to the first electrode for amplifying the first  
signals, the first amplifier having an input impedance approaching infinity, and

20 a second amplifier coupled to the second electrode for amplifying the  
second signals, the second amplifier having an input impedance approaching  
infinity, and

a differential circuit connected to the first and second amplifiers to  
eliminate noise and to produce an output signal representing the difference between  
25 the first and second signals.

22. In a combination as set forth in claim 21 wherein  
the first and second amplifiers have substantially identical  
characteristics.

23. In a combination as set forth in claim 21 wherein  
each of the amplifiers has an input impedance of approximately  $10^{15}$   
ohms and having an output impedance of approximately 50 ohms to 75 ohms.

24. In a combination as set forth in claim 27 wherein the first and second  
amplifiers have substantially identical characteristics.

25. In combination for providing at selective positions on a patient's skin  
first signals representing the patient's parameters at these positions,  
an electrode coupled to the patient's skin at one of the selective  
positions for producing second signals representing the patient's parameters at this  
position, and

an amplifier connected to the first electrode for amplifying the signals  
from the electrode, the amplifier having an input impedance approaching infinity.

26. In a combination as set forth in claim 25 wherein  
the amplifier has an input impedance of approximately  $10^{15}$  ohms.

27. In a combination as set forth in claim 25 wherein  
the amplifier has an output impedance considerably less than the input  
impedance of the amplifier.

28. In a combination as set forth in claim 26 wherein  
the amplifier has an output impedance of approximately 50 ohms to  
75 ohms.

29. In a combination as set forth in claim 26,  
a low pass filter coupled to the output of the amplifier to receive the  
signals from the amplifier, and

a printed circuit board for holding the amplifier and the low pass filter  
5 with the amplifier in physically and electrically displaced relationship to the low  
pass filter.

30. In a combination as set forth in claim 29,  
a second low pass filter connected between the electrode and the input  
to the amplifier to pass signals below a particular frequency.

10 31. In a combination as set forth in claim 29 wherein  
the differential circuit is a first differential circuit and is connected to  
the outputs of the amplifiers to operate as a low pass filter for passing signals below  
a particular frequency and to eliminate noise and wherein

a second differential circuit is connected between the electrode and  
15 the amplifiers to operate as a low pass filter for passing signals below the particular  
frequency and to eliminate noise.

32. In a combination as set forth in claim 1 wherein

the amplifier has an input and an output and wherein

the output stage is connected to the output of the amplifier and

20 wherein

a second stage is connected between the electrode and the input of the  
amplifier and is constructed to reject noise and to pass signals at frequencies below  
the particular value.

33 In a combination as set forth in claim 6 wherein

the amplifier has an input and an output and wherein

the low pass filter is a first low pass filter and is connected to the  
output of the amplifier to provide an output in which noise is eliminated and signals  
5 in the particular frequency range are passed by the low pass filter and wherein

a second low pass filter is connected between the electrode and the  
input of the amplifier to eliminate noise and to pass signals in the particular  
frequency range.

34. In a combination as set forth in claim 6 wherein

10 the first low pass filter operates on a differential basis and wherein

the second low pass filter operates on a differential basis.

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